MULTIMEDIA UNIVERSITY

STUDENT ID

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

TIS1101 – Database Fundamentals

(All sections / Groups)

17 OCTOBER 2016
2.30 p.m - 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 5 pages, including the cover page, with FOUR questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the answer booklet provided.

Answer ALL Questions

QUESTION 1

You are required to design the database for the Blood Bank Management System based on the following business rules:

- A donor may donate blood any number of times.
- Many donors may register for blood donation with a single reception.
- There are many blood types. Each blood belongs to a single type.
- Blood donated is stored in Blood Bank, while each Blood Bank stores many donated blood.
- Hospitals may order blood from different Blood Banks. Each Blood Bank may supply blood to any number of hospitals.

(a) Based on the given scenario, draw an ER diagram (logical model) based on Crow's Foot model to represent the data requirements for the Blood Bank Management System. Your ER diagram must include the cardinalities, connectivities, relationships. You do not need to include the attributes in your ER diagram.

[7 marks]

(b) Based on your ER diagram in Q1(a), identify ONE example of strong relationship. Justify your answer.

[2 marks]

(c) Define what derived attribute is. Give an example of the derived attribute based on scenario above.

[1 mark]

Continued .....

QUESTION 2

The following is a database consisting of SEVEN relations. The primary keys of the relations are underlined and the dashed lines indicate the foreign keys.

Policy (PolID, PolPrice, PolCoverage, CustID)

Automobile_policy (APolID, PolID, IssueDate)

Home_policy (HPolID, PolID, EffectiveDate, TermPrice)

House (HouseNo, HouseAddress, HPolID)

Vehicle (VehicleNo, Capacity, APolID, ManuDate, TypeID)

Veh_Type (TypeID, TypeDescription)

Customer (CustID, CustName)

Answer questions (a) to (e) based on the relations above.

(a) Assume that `Policy` table has been created. Write the Data Definition Language (DDL) script to create the `Home_policy` table.

[2 marks]

(b) Write a SQL statement to list the maximum `TermPrice` in the `Home_policy` table.

[1 mark]

(c) Write a SQL statement to list `CustName` that has both Automobile policy and Home policy.

[2 marks]

(d) Write a SQL statement to list the `VehicleNo` under the `type` 'MPV', which is `manufactured` before year 2016 and has the engine `capacity` greater than 1.5 cc.

[2 marks]

(e) Write a trigger to update the column `EffectiveDate` in the `Home_policy` table to `2016-08-31` whenever a new record is inserted.

[3 marks]

Continued .....

QUESTION 3

The following table shows sample entries of a construction equipment rental company:

CustID	CustName	EquipID	EquipModel	EquipType	EquipCharges	RentalDays	RentalDate
101	Jill	E425	234J	Excavator	2500.00	5	12-08-2016
101	Jill	E426	310K	Dozer	1800.00	3	14-08-2016
102	Mike	E425	234J	Excavator	2500.00	2	31-07-2016
103	Aini	E427	62G	Loader	2200.00	3	31-07-2016
103	Aini	E500	987W	Forklift	1200.00	4	08-08-2016
102	Mike	E426	310K	Dozer	1800.00	1	06-06-2016

(a) Draw the dependency diagram in 1NF for the above table, showing the partial and transitive dependencies. Underline the primary key.

[4 marks]

(b) Based on your solution in Question 3(a), normalize the dependency diagram to 2NF. Underline the primary key.

[3 marks]

(c) Based on your solution in Question 3(b), normalize the dependency diagram to 3NF. Underline the primary key and use dashed line for foreign key.

[3 marks]

Continued .....

QUESTION 4

(a) Discuss any FOUR advantages of cloud computing.

[4 marks]

(b) Suppose that you have been asked to design a database for a course registration system. What are the THREE most important questions that need to be addressed when defining the objectives for the above database system?

[3 marks]

(c) Why adding a time dimension is important in a data warehouse?

[3 marks]

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